

can also be used to quickly compare improvement alternatives according to the capacity they provide.

## 4. Scoping and Screening Method

### Generalized Service Volume Table

Whether or not a more detailed freeway facility analysis is needed can be determined by comparing the counted or forecasted peak hour or daily traffic volumes for the sections of the freeway between each on- and off-ramp to the values given in Exhibit 19. If all of the section volumes fall in the LOS E range or better, there will be no congestion spillover requiring a full facility analysis to better quantify the facility's performance. One can then use the HCM segment analysis procedures with defaults for some of the inputs to evaluate the performance of each segment. (Note that "segments" have a special definition in the HCM, while "sections" are defined in this Guide by the freeway on- and off-ramps.)

The service volumes in Exhibit 19 can also be used to quickly determine the geographic and temporal extent of the freeway facility that will require analysis. If the counted or forecasted volumes for a section fall below the agency's target LOS standard, then the section can be excluded from a more detailed analysis. If the volumes fall near or above the volume threshold for the agency's target LOS, then the section may require more detailed analysis.

Any section that exceeds the capacity values in Exhibit 19 will have queuing that may impact upstream sections and reduce downstream demands. In such a situation, a full freeway facility analysis is required to ascertain the freeway's performance. The facility analysis can be performed either using the HCM method with defaults, or the simplified HCM method, both of which are described later in this section.

The analyst may also use the capacities shown in Exhibit 19 to compute the peak hour, peak direction demand-to-capacity ratio for each segment under various improvement options. These options can then be quickly ranked according to their forecasted demand-to-capacity ratios for the critical sections of the freeway.

**Exhibit 19. Daily and peak hour service volume and capacity table for freeways.**

Area Type	Terrain	Peak Hour Peak Direction (veh/h/ln)			AADT (2-way veh/day/ln)		
		LOS A-C	LOS D	LOS E (capacity)	LOS A-C	LOS D	LOS E (capacity)
Urban	Level	1,550	1,890	2,150	14,400	17,500	19,900
Urban	Rolling	1,480	1,810	2,050	13,700	16,700	19,000
Rural	Level	1,460	1,770	2,010	12,100	14,800	16,800
Rural	Rolling	1,310	1,600	1,820	11,000	13,400	15,200

Source: Adapted from HCM (2016), Exhibit 12-39 and 12-40.

Notes: Entries are maximum vehicle volumes per lane that can be accommodated at stated LOS.

AADT = annual average daily traffic. AADT per lane is two-way AADT divided by the sum of lanes in both directions.

Urban area assumptions: Free-flow speed = 70 mph, 5% trucks, 0% buses, 0% RVs, peak hour factor = 0.94, 3 ramps/mi, 12-ft lanes, *K*-factor = 0.09, and *D*-factor = 0.60.

Rural area assumptions: Free-flow speed = 70 mph, 12% trucks, 0% buses, 0% RVs, peak hour factor = 0.94, 0.2 ramps/mi, capacity adjustment factor for driver population = 1.00, 12-ft lanes, 6-ft lateral clearance, *K*-factor = 0.10, and *D*-factor = 0.60.

Similar tables can be developed by adjusting input values to reflect other assumptions.

The *K*-factor is the ratio of weekday peak hour two-way traffic to AADT. The *D*-factor is the proportion of peak hour traffic in the peak direction.